

# CORTEX USERS GROUP

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## CORTEX USER GROUP NEWSLETTER (MAY 1988)

### Issue Number 18

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## Editorial

You may notice the better print quality in the Newsletter this month. That is because we have invested in one of the Royal Office Master 2000 daisy wheel printers available from Matmos Ltd for £119.00. Its very good value for money. The printer works well with the Cortex using centronics interface. I believe that a version is also available with serial interface. The only problem with the printer is that there is no english character set that gives a £ sign instead of the #. To get the £ you have to print "<1B5B>" from cortex basic. There is a modified version available from Aztech office supplies which substitutes the £ for the # but it is slightly more expensive. Also the ribbon supplied with the machine may be very short so it would be as well to order a spare one.

Matmos Ltd, 1 Church street, Chuckfield, West sussex.  
0444 414484

Aztec Office Equipment Ltd "High winds" South End, Much Hadham,  
Herts. 027 984 2036

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## Corrections for Canyon and Missile Command P.D.Wrightson

The problems that people are having with the games in the christmas issue due to the keyboard reading routine also reading other things like the disk size and density jumper settings and some device interrupt signals. The solution is not to read the extra information. The following modifications to the programmes cure the problem.

### Canyon

```
5 BASE 16
670 A=KEY[0]:A=CRF[8]:IF A<>CRF[8] OR B=1 THEN GOTO 350
680 IF A=8 THEN P1=-1:GOTO 350
690 IF A=9 THEN P1=1:GOTO 350
700 IF A=52H AND P0>80 THEN P1=-80:GOTO 350
710 IF A=46H AND P0<800 THEN P1=40:GOTO 350
720 IF A<>45H THEN GOTO 350
```

### Missile Command

```
5 BASE 16
1050 A=CRF[8]:B=CRF[8]:IFA<>B THEN GOTO 1130
1060 M=KEY[0]
1070 IF A=41H OR A=53H OR A=44H THEN GOSUB 1190
1080 IF A=8 AND PX>7 THEN PX=PX-4:GOTO 1120
1090 IF A=9 AND PX<240 THEN PX=PX+4:GOTO 1120
1100 IF A=OBH AND PY>8 THEN PY=PY-4:GOTO 1120
1110 IF A=OAH AND PY<152 THEN PY=PY+4
1220 IF A=53H THEN GOTO 1270
1230 IF A=44H THEN GOTO 1280
```

Note that the numbers in the comparisons are the ascii values of the keys pressed to control the games.

## MDEX UTILITIES

A.R.C.Badcock

Alan has sent in a few usefull utilities for use under MDEX some of them will be included in this and future issues. But all of them, and the source listings, will be added to the utilities disk available from the Group.

XTRM Utility to toggle between using an external terminal or the Cortex consol for main input/output. Qbasic Prog.  
STRM A simmilar routine written in assembler. More compact with no messages  
LCASE Lower case character loader.  
MAPON Switches mapper on  
MAPOFF Switches mapper off  
MAPLOAD Mapper register setup utility  
COLOUR Utility to set cortex screen colours  
CONFIG Utility to get a readout of your MDEX I/O driver Configuration tables.  
UTY.LAB Datafile for above.

All the assembler programmes are set to run at 0F200H so if you have not done the mod to get this extra memory available the source code will hav to be re-assembled to run elsware.

External terminal switch routine for mdex

A.R.C.Badcock

Written in QBASIC

```
1 {  
    EXTERNAL TERMINAL SWITCH ROUTINE  
    COPYRIGHT A.R.C.BADCOCK (C) 1984
```

This routine redirects console I/O to an external terminal via the serial port. The console switch is set in the CORTEX unit table pointed to by the base value at 00FEh , and offset by [KEYBOARD=2 and SCREEN=4]. Setting these words switches to ext., and clearing them to int.

```
}
```

STRM terminal toggle for MDEX

A.R.C.Badcock

-----  
STRM : TERMINAL PATCH ROUTINE v1.0  
By A.R.C.Badcock - Copyright (C)1984  
-----  
.  
.  
.  
This MDEX v3.3 relocatable assembler  
code is to enable switching between  
an external VDU terminal and the  
normal CORTEX console.  
The routine patches the console unit  
table at [BASE+2 & BASE+4] words.  
These are set to OFFFFh for external  
VDU and reset to 0000h for CORTEX  
console. The BASE pointer is read  
from the guaranteed vector at 00FEh.  
The status of console path is toggled.  
command = STRM

.  
. IDT "STRM" .Program ID  
. RORG  
. COPY "1/JSYS\$" .system calls  
UT\$CON EQU 000FE .console table ptr  
. Locate console table address  
START LI R7,UT\$CON .Get pointer  
MOV \*R7,R8 .Get address  
. Switch keyboard  
KBDSET INCT R8 .Add offset  
INV \*R8 .Switch kbd  
. Switch CRT screen  
CRTSET INCT R8 .Add offset  
INV \*R8 .Switch crt  
. Done - exit to system  
JSYS FINISH  
FINISH BYTE EXIT\$,0  
DATA 00000  
. END START . Entry label

## MONITOR COMMAND EXTENSION.

Cortex implements its Monitor commands by matching the command letter against entries in a look-up table situated @>A3C to A90. Each entry consists of two consecutive sixteen bit words:-

Word 1. MSB is Ascii code of letter, LSB is the required number of parameters.

Word 2. The entry address of the relevant routine.

There are two spare spaces in the table, but if more commands are required, these may be used to direct execution to a user written table and search routine for a two-letter command mnemonic. Thus each new entry gives up to 26 extra commands.

The ASM routine included uses 'J' as the first letter, then 'R,W,P,etc' as second letters. You may of course choose your own by changing the ascii codes accordingly.

Location @>A88 is set to >4A00, ascii 'J', with no parameters, and @>ABA to the entry address of your search routine. This could be done by a small application routine, or at CDOS boot time.

The listing was done under MDEX, but add your own start address to those in the left-hand column and enter the opcodes via the 'M' command to save under CDOS.

MON-EXT

JCOM

Page 1

0000		1.	TITL "MON-EXT"
0000		2.	IDT "MON COMMAND EXTENSION"
0000 02E0 0000		3. JCOM	LWPI WSP1
0004 02A9		4.	STWP 9
0006 04CA		5.	CLR 10
0008 0F46		6.	DATA 0F46
000A 020B 003C		7.	LI 11,JTAB
000E D2BB		8. J6	MOV B *11+,10
0010 1313		9.	JEQ J5
0012 9286		10.	CB 6,10
0014 1303		11.	JEQ J2
0016 022B 0003		12.	AI 11,3
001A 10F9		13.	JMP J6
001C 0F06		14. J2	DATA 0F06
001E 0009 2000		15.	DATA 9,02000
0022 D2BB		16.	MOV B *11+,10
0024 098A		17.	SRL 10,8
0026 1306		18.	JEQ J4
0028 0E46 0038 0038		19. J3	DATA 0E46,J5,J5
002E CE46		20.	MOV B,*9+
0030 060A		21.	DEC 10
0032 1BFA		22.	JH J3
0034 C29B		23. J4	MOV *11,10
0036 069A		24.	BL *10
0038 0460 0A06		25. J5	B @0A06
		26.	
003C 5202 0000 5702		27. JTAB	DATA 05202,JR,05702,JW,05000,JP
0042 0000 5000 0000			
0048 4904 0000 4F04		28.	DATA 04904,JI,04F04,JO,04D04,JM,04304,
JC,0,0			
004E 0000 4D04 0000			
0054 4304 0000 0000			
005A 0000			
005C		29.	END JCOM

Use MDEX to write your files, then bring them into CDOS with this pgm.

Most Mdex facilities can be used, ASM, Edit, Word, etc, but not Basic.

Cortex Basic is quicker & better anyway!

100 ; "<OC>MTOC. MDEX to CDOS file translator." O.C.Walden.  
110 ; ; ; "For Help type 'H'...or anything else to continue."  
120 K=KEY[0]: IF K=048H THEN GOTO 490  
130 IF K=0 THEN GOTO 120  
140 ; ; ; ; ; "\*\* Fit your MDEX disk now. \*\*"  
145 FOR Q=1 TO 29: ; "<095>": NEXT Q: ; ; ; ; ; "<07>"  
150 DATA 1,5,9,13,17,21,25  
160 DATA 2,6,10,14,18,22,26  
170 DATA 3,7,11,15,19,23  
180 DATA 4,8,12,16,20,24  
190 DIM P[25],X[4]  
200 FOR Q=0 TO 25: READ P[Q]: NEXT Q: RESTOR  
210 AX=ADR[X[0]]  
220 MWD[AX]=0420H: MWD[AX+2]=06260H  
230 MWD[AX+4]=0D8C6H: MWD[AX+6]=02H  
240 MWD[AX+8]=0380H  
250 INPUT "DRIVE?";" (0/3) :D  
260 IF D<0 OR D>3 THEN GOTO 260  
270 INPUT "START BLOCK No.? ";B  
280 INPUT "LENGTH IN BLOCKS? ";L  
290 INPUT "RAM BASE? ";R  
297 FOR RT=1 TO 3  
300 MAR=R: RT=3: E=0  
310 T=INT[B/26]: BS=INT[B-T\*26]: B=BS  
320 ; ; ; ; "Drive Track Sector Rambase":  
340 FOR Q=1 TO L  
350 ; E,T,P[B],#MAR: WAIT 10  
360 CALL "MTOC",AX,D,T,P[B]-1,ADR[E],MAR,0,0  
365 IF E<>0 THEN GOTO 405  
370 B=B+1: MAR=MAR+128  
380 IF B>25 THEN B=0: T=T+1  
390 NEXT Q  
402 IF E=0 THEN GOTO 420  
405 ; "READ ERROR";#E/256 LAND 03FH  
410 NEXT RT  
415 GOTO 430  
420 ; ; ; ; "File is @";#R" TO";#(MAR-2)  
425 ; ; ; ; "\*\* Change disk before Saving \*\*"  
426 FOR Q=1 TO 31: ; "<095>": NEXT Q  
430 END  
440 REM For 5 inch drives, alter as below:-  
450 REM Change 25 to 15 in lines 190,200,310  
460 REM Change 26 to 16 in lines 380.  
465 REM Change Data block to:-  
470 REM DATA 1,5,9,13,2,6,10,14  
480 REM DATA 3,7,11,15,4,8,12,16  
490 ; "Running under CDOS, the pgm will read MDEX standard files into Ram"  
495 ; "where they can be used in situ, or SAVE'd with CDOS."  
500 ; "Obtain Start & Length from Mdex Dir. Mdex files use their":  
510 ; " first sector as a Header block. To avoid this use Start+1 & Length-1."  
520 ; "All MTOC parameters may be decimal or hex."  
530 ; "When writing ASM pgms, Opcodes not supported by Mdex should be entered as"  
535 ; "Data words. Start ASM at RORG 0 and Link to your required Base in CDOS."  
540 ; "For 5 inch Drives make the alterations shown at Lines 440 to 480."  
550 ; "Type any key to return to pgm."  
555 K=KEY[0]: IF K=0 THEN GOTO 555  
560 GOTO 140

These two programmes were sent in on tape by Dennis Johnson. The first one is based on othello and is designed for two players. It uses the screen for the board, pieces and score board. The second Programme is a version of the popular MASTERMIND game it only takes a few minuits to load but can get you hooked. It would be nice to see some more programmes suitable for tape sent into the newsletter so please have a look arround to see if you have anything available.

"OTHELLO" Dennis Johnson

```
1 TEXT
2 PRINT @"C"
3 GOTO 4000
5 GRAPH
7 DIM A[7,7],B[7,7],C[10]
8 I1=2: I2=2: E=0
10 GOTO 1000
15 SHAPE 1,-1,-1,-1,-1
17 SHAPE 2,0FF81H,08181H,08181H,081FFH
18 SHAPE 3,08142H,02418H,01824H,04281H
20 FOR X=28 TO 156 STEP 16
30 PLOT 60,X TO 188,X
40 NEXT X
50 FOR Y=60 TO 188 STEP 16
60 PLOT Y,28 TO Y,156
70 NEXT Y
73 SPUT 334,1: SPUT 336,2
75 SPUT 398,2: SPUT 400,1
77 B[3,3]=1: B[4,4]=1: B[3,4]=2: B[4,3]=2
80 SPRITE 1,64,31,3,15
90 H=64: V=31: P=136: D=1: X=0: Y=0
92 Z=P
100 F=KEY[0]
102 E=0
105 PRINT @(2,22);#"99";"BLACK = ";I1;#"99";" WHITE = ";I2
110 IF F=0 THEN GOTO 100
120 IF F=08H THEN GOTO 200
130 IF F=09H THEN GOTO 300
140 IF F=0AH THEN GOTO 400
150 IF F=0BH THEN GOTO 500
160 IF F=01EH THEN GOTO 600
200 IF H<=64 THEN GOTO 100
205 H=H-16: P=P-2: Y=Y-1
210 SPRITE 1,H,V
220 GOTO 100
300 IF H>=176 THEN GOTO 100
305 H=H+16: P=P+2: Y=Y+1
310 SPRITE 1,H,V
320 GOTO 100
400 IF V>=143 THEN GOTO 100
405 V=V+16: P=P+64: X=X+1
410 SPRITE 1,H,V
420 GOTO 100
500 IF V<=31 THEN GOTO 100
505 V=V-16: P=P-64: X=X-1
510 SPRITE 1,H,V
520 GOTO 100
600 IF P=Z THEN GOTO 100
602 IF B[X,Y]<>0 THEN GOTO 700
```

```

603  SPUT P,D
605  B[X,Y]=D
610  IF D=1 THEN D=2: I1=I1+1
620    ELSE D=1: I2=I2+1
630  Z=P
640  X1=X: Y1=Y
650  D2=D: IF D=1 THEN D1=2
660    ELSE D1=1
670  GOTO 2000
700  PRINT @(5,20);"ILLEGAL MOVE TRY AGAIN"
710  WAIT 100
720  PRINT @(5,20);"
730  GOTO 100
800  IF E=1 THEN GOTO 100
810  IF D=1 THEN D=2: I2=I2-1
820    ELSE D=1: I1=I1-1
830  B[X,Y]=0
840  SPUT A[X,Y],0
850  GOTO 700
1000 DATA 136,138,140,142,144,146,148,150
1010 DATA 200,202,204,206,208,210,212,214
1020 DATA 264,266,268,270,272,274,276,278
1030 DATA 328,330,332,334,336,338,340,342
1040 DATA 392,394,396,398,400,402,404,406
1050 DATA 456,458,460,462,464,466,468,470
1060 DATA 520,522,524,526,528,530,532,534
1070 DATA 584,586,588,590,592,594,596,598
1100 FOR X=0 TO 7
1110   FOR Y=0 TO 7
1130     READ A[X,Y]
1140     NEXT Y
1150   NEXT X
1160   GOTO 15
2000 Q=1: R=0
2010 IF Y1=7 THEN GOTO 2220
2020 IF Y1=6 THEN GOTO 2220
2030 M=1
2040 IF B[X1,Y1+M]=D1 THEN GOTO 2220
2045 IF B[X1,Y1+M]=0 THEN GOTO 2220
2050 C[R]=A[X,Y1+M]: R=R+1
2060 M=M+1
2070 IF B[X1,Y1+M]=D1 THEN GOTO 2110
2075 IF B[X1,Y1+M]=0 THEN GOTO 2190
2080 C[R]=A[X1,Y1+M]: R=R+1
2090 IF Y1+M=7 THEN GOTO 2190
2100 GOTO 2060
2110 R=0: M=M-1: E=1
2120 SPUT C[R],D1
2130 B[X,Y1+M]=D1
2140 IF D1=1 THEN I1=I1+1: I2=I2-1
2150   ELSE I1=I1-1: I2=I2+1
2160 R=R+1: M=M-1
2170 IF C[R]=0 THEN GOTO 2190
2180 GOTO 2120
2190 FOR J=0 TO 10
2200 C[J]=0
2210 NEXT J
2220 Q=Q+1
2230 IF Q>8 THEN GOTO 800
2240 ON Q THEN GOTO 2000,2300,2500,2700,2900,3100,3300,3500

```

```

2250 GOTO 100
2300 R=0: X1=X: Y1=Y
2310 IF Y1=7 OR X1=7 THEN GOTO 2220
2320 IF Y1=6 OR X1=6 THEN GOTO 2220
2330 M=1
2340 IF B[X1+M,Y1+M]=D1 THEN GOTO 2220
2345 IF B[X1+M,Y1+M]=0 THEN GOTO 2220
2350 C[R]=A[X1+M,Y1+M]: R=R+1
2360 M=M+1
2370 IF B[X1+M,Y1+M]=D1 THEN GOTO 2410
2375 IF B[X1+M,Y1+M]=0 THEN GOTO 2190
2380 C[R]=A[X1+M,Y1+M]: R=R+1
2390 IF Y1+M=7 THEN GOTO 2190
2395 IF X1+M=7 THEN GOTO 2190
2400 GOTO 2360
2410 R=0: M=M-1: E=1
2420 SPUT C[R],D1
2430 B[X1+M,Y1+M]=D1
2440 IF D1=1 THEN I1=I1+1: I2=I2-1
2450 ELSE I1=I1-1: I2=I2+1
2460 R=R+1: M=M-1
2470 IF C[R]=0 THEN GOTO 2190
2480 GOTO 2420
2500 R=0: X1=X: Y1=Y
2510 IF X1=7 OR X1=6 THEN GOTO 2220
2520 M=1
2540 IF B[X1+M,Y1]=D1 THEN GOTO 2220
2545 IF B[X1+M,Y1]=0 THEN GOTO 2220
2550 C[R]=A[X1+M,Y1]: R=R+1
2560 M=M+1
2570 IF B[X1+M,Y1]=D1 THEN GOTO 2610
2575 IF B[X1+M,Y1]=0 THEN GOTO 2190
2580 C[R]=A[X1+M,Y1]: R=R+1
2590 IF X1+M=7 THEN GOTO 2190
2600 GOTO 2560
2610 R=0: M=M-1: E=1
2620 SPUT C[R],D1
2630 B[X1+M,Y1]=D1
2640 IF D1=1 THEN I1=I1+1: I2=I2-1
2650 ELSE I1=I1-1: I2=I2+1
2660 R=R+1: M=M-1
2670 IF C[R]=0 THEN GOTO 2190
2680 GOTO 2620
2700 R=0: X1=X: Y1=Y
2710 IF X1=7 OR Y1=0 THEN GOTO 2220
2720 IF X1=6 OR Y1=1 THEN GOTO 2220
2730 M=1
2740 IF B[X1+M,Y1-M]=D1 THEN GOTO 2220
2745 IF B[X1+M,Y1-M]=0 THEN GOTO 2220
2750 C[R]=A[X1+M,Y1-M]: R=R+1
2760 M=M+1
2770 IF B[X1+M,Y1-M]=D1 THEN GOTO 2810
2775 IF B[X1+M,Y1-M]=0 THEN GOTO 2190
2780 C[R]=A[X1+M,Y1-M]: R=R+1
2790 IF X1+M=7 OR Y1-M=0 THEN GOTO 2190
2800 GOTO 2760
2810 R=0: M=M-1: E=1
2820 SPUT C[R],D1
2830 B[X1+M,Y1-M]=D1
2840 IF D1=1 THEN I1=I1+1: I2=I2-1

```

```

2850 ELSE I1=I1-1: I2=I2+1
2860 R=R+1: M=M-1
2870 IF C[R]=0 THEN GOTO 2190
2880 GOTO 2820
2900 R=0: X1=X: Y1=Y
2910 IF Y1=0 OR Y1=1 THEN GOTO 2220
2920 M=1
2930 IF B[X1,Y1-M]=D1 THEN GOTO 2220
2935 IF B[X1,Y1-M]=0 THEN GOTO 2220
2940 C[R]=A[X1,Y1-M]: R=R+1
2950 M=M+1
2960 IF B[X1,Y1-M]=D1 THEN GOTO 3000
2965 IF B[X1,Y1-M]=0 THEN GOTO 2190
2970 C[R]=A[X1,Y1-M]: R=R+1
2980 IF Y1-M=0 THEN GOTO 2190
2990 GOTO 2950
3000 R=0: M=M-1: E=1
3010 SPUT C[R],D1
3020 B[X1,Y1-M]=D1
3030 IF D1=1 THEN I1=I1+1: I2=I2-1
3040 ELSE I1=I1-1: I2=I2+1
3050 R=R+1: M=M-1
3060 IF C[R]=0 THEN GOTO 2190
3070 GOTO 3010
3100 R=0: X1=X: Y1=Y
3110 IF Y1=0 OR X1=0 THEN GOTO 2220
3120 IF Y1=1 OR X1=1 THEN GOTO 2220
3130 M=1
3140 IF B[X1-M,Y1-M]=D1 THEN GOTO 2220
3145 IF B[X1-M,Y1-M]=0 THEN GOTO 2220
3150 C[R]=A[X1-M,Y1-M]: R=R+1
3160 M=M+1
3170 IF B[X1-M,Y1-M]=D1 THEN GOTO 3210
3175 IF B[X1-M,Y1-M]=0 THEN GOTO 2190
3180 C[R]=A[X1-M,Y1-M]: R=R+1
3190 IF X1-M=0 OR Y1-M=0 THEN GOTO 2190
3200 GOTO 3160
3210 R=0: M=M-1: E=1
3220 SPUT C[R],D1
3230 B[X1-M,Y1-M]=D1
3240 IF D1=1 THEN I1=I1+1: I2=I2-1
3250 ELSE I1=I1-1: I2=I2+1
3260 R=R+1: M=M-1
3270 IF C[R]=0 THEN GOTO 2190
3280 GOTO 3220
3300 R=0: X1=X: Y1=Y
3310 IF X1=0 OR X1=1 THEN GOTO 2220
3330 M=1
3340 IF B[X1-M,Y1]=D1 THEN GOTO 2220
3345 IF B[X1-M,Y1]=0 THEN GOTO 2220
3350 C[R]=A[X1-M,Y1]: R=R+1
3360 M=M+1
3370 IF B[X1-M,Y1]=D1 THEN GOTO 3410
3375 IF B[X1-M,Y1]=0 THEN GOTO 2190
3380 C[R]=A[X1-M,Y1]: R=R+1
3390 IF X1-M=0 THEN GOTO 2190
3400 GOTO 3360
3410 R=0: M=M-1: E=1
3420 SPUT C[R],D1
3430 B[X1-M,Y1]=D1

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```
3440 IF D1=1 THEN I1=I1+1: I2=I2-1
3450 ELSE I1=I1-1: I2=I2+1
3460 R=R+1: M=M-1
3470 IF C[R]=0 THEN GOTO 2190
3480 GOTO 3420
3500 R=0: X1=X: Y1=Y
3510 IF Y1=7 OR Y1=6 THEN GOTO 2220
3520 IF X1=0 OR X1=1 THEN GOTO 2220
3530 M=1
3540 IF B[X1-M,Y1+M]=D1 THEN GOTO 2220
3545 IF B[X1-M,Y1+M]=0 THEN GOTO 2220
3550 C[R]=A[X1-M,Y1+M]: R=R+1
3560 M=M+1
3570 IF B[X1-M,Y1+M]=D1 THEN GOTO 3610
3575 IF B[X1-M,Y1+M]=0 THEN GOTO 2190
3580 C[R]=A[X1-M,Y1+M]: R=R+1
3590 IF X1-M=0 OR Y1+M=7 THEN GOTO 2190
3600 GOTO 3560
3610 R=0: M=M-1: E=1
3620 SPUT C[R],D1
3630 B[X1-M,Y1+M]=D1
3640 IF D1=1 THEN I1=I1+1: I2=I2-1
3650 ELSE I1=I1-1: I2=I2+1
3660 R=R+1: M=M-1
3670 IF C[R]=0 THEN GOTO 2190
3680 GOTO 3620
4000 PRINT @"8D2R";"A BOARD GAME BASED ON OTHELLO"
4005 PRINT @"2R";"(by D.W.Johnson)"
4010 PRINT @"2R";"Moves are made with the cursor keys"
4020 PRINT @"2R";"and a piece is set with the home key."
4030 PRINT @"2R";"Black moves first and illegal moves."
4040 PRINT @"2R";"are cautioned."
4050 PRINT @"2D2R";"Press any key to start"
4060 F=KEY[0]
4070 IF F<>0 THEN GOTO 5
4080 GOTO 4060
```

```

5 PRINT @"C"
10 PRINT @"8D10R";"MASTER MIND COMPETITION"
20 PRINT @"2D10R";"GUESS THE RANDOM NUMBER"
22 PRINT @"2D13R";"(by D.W.Johnson)"
25 PRINT @"2D10R"
30 INPUT "HOW MANY DIGITS(12 MAX) ? ";D
35 PRINT @"2D10R"
40 INPUT "HOW MANY TRIES ? ";T
50 DIM R[12]: DIM S[12]: DIM B[12]: E=0
60 GOSUB 300
70 GOSUB 700
80 GOSUB 200
90 GOSUB 400
100 IF CN=D AND CP=D THEN GOTO 600
110 PRINT @"B28R";CN;: PRINT @"4R";CP
120 E=E+1
130 IF E=T THEN GOTO 500
140 GOTO 80
200 FOR A=1 TO D
210 F=KEY[0]
220 IF F=0 THEN GOTO 210
230 B[A]=F-48
235 PRINT B[A];
240 NEXT A
250 RETURN
300 FOR A=1 TO D
310 R[A]=INT[RND*9]
320 S[A]=R[A]
330 NEXT A
340 RETURN
400 CN=0: CP=0
402 FOR A=1 TO D
404 IF B[A]=S[A] THEN CP=CP+1
406 NEXT A
410 FOR A=1 TO D
420 FOR C=1 TO D
430 IF B[A]=S[C] THEN CN=CN+1: S[C]=10: B[A]=20
440 NEXT C
450 NEXT A
460 FOR C=1 TO D
470 S[C]=R[C]
480 NEXT C
490 RETURN
500 PRINT "HARD LUCK,THE NUMBER WAS"
510 FOR A=1 TO D
520 PRINT R[A];
530 NEXT A
535 PRINT
540 INPUT " TRY AGAIN ? (Y OR N)";$G
550 IF $G="Y" THEN GOTO 25
560 STOP
600 PRINT " WELL DONE"
610 GOTO 540
700 PRINT @"C"
710 PRINT @"1D1R";"YOUR ATTEMPTS"
720 PRINT @"1U28R";"RESULTS"
730 PRINT @"1D27R";"NUMBS POSNS"
740 RETURN

```

## Compressed graphics screen save routine

Tim Gray

This routine copies the VDP memory into main memory using a compressed data format. Using this method most graphics screens take up less than 4K bytes instead of the 16K normal. To use the routine first reserve enough memory with

```
DIM SCN[2730]
```

Then call the routine with

```
CALL XXXX,ADR[SCN[0]]
```

Where XXXX is the start address of either the save or load routines as assembled. At the end of the save the length of the data block can be obtained from the first word of SCN[0]. So to save to disk use

```
LN=MWD[ADR[SCN[0]]]  
OPEN drive,filename,filevariable,CRE,LN  
PUT filevariable,0,SCN[0]  
CLOSE filevariable
```

And to Recall the stored screen

```
GRAPH  
OPEN drive,filename,filevariable  
GET filevariable,0,SCN[0]  
CALL XXXX,ADR[SCN[0]]
```

## Listing Of Assembler Source File "SCNSAV.S"

```
01 ;  
02 ; COMPRESSED SCREEN SAVE AND LOAD  
03 ;  
04 ; TIM GRAY 1988  
05 ;  
06 ; COMPRESSED SAVE  
07 ;  
08 ;  
09 ORG >F200  
10 ;  
11 XSVDP EQU >05F2  
12 XVDP EQU >F120  
13 ;  
14 SAVE: CLR R4 ;byte count  
15 . CLR R8 ;VDP start  
16 MOV R0,R9 ;save start  
17 BL @XSVDP ;setup VDP  
18 LI R8,>4000 ;max display  
19 LI R1,>0002 ;jump count wd  
20 INCT R0  
21 BYTE1: MOVB @XVDP,R2 ;get 1st byte  
22 DEC R8  
23 MOVB R2,*R0+ ;save it  
24 INC R1 ;inc counter  
25 NDATA: MOVB @XVDP,R3 ;get next byte  
26 DEC R8
```

```

27      JLT EXIT
28      CB R2,R3      ;match ?
29      JNE DIFF
30      INC R4        ;yes inc by cnt
31      CI R4,>100   ;max=256
32      JLT NDATA    ;no next data
33      DEC R4        ;set to 256
34 DIFF:  SLA R4,8    ;align data
35      MOVB R4,*R0+   ;save byte count
36      CLR R4        ;reset by count
37      MOVB R3,*R0+   ;save next data
38      MOVB R3,R2    ;copy it
39      INCT R1        ;inc counter
40      CI R1,>4000   ;max 16K ?
41      JGT ERROR1    ;overflow err
42      MOV R8,R8      ;end display ?
43      JLT EXIT       ;yes exit
44      JMP NDATA     ;no get next
45 ERROR1: XOP @>OA,14 ;out of mem
46 EXIT:   MOV R1,*R9   ;save tot count
47      SLA R4,8      ;align data
48      MOVB R4,*R0    ;save byte count
49      RTWP
50 ;

```

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```

01 ;
02 ;
03 ;
04 ;COMPRESSED SCREEN LOAD
05 ;
06 LOAD:  INCT R0      ;step over count
07      LI R8,>4000   ;write zero
08      BL @XSVDP    ;setup VDP
09      LI R1,>4000   ;max 16K
10 DATA:   MOVB *R0+,R2 ;get 1st data
11      MOVB *R0+,R3   ;get byte count
12      SRL R3,8      ;align it
13 MDATA:  MOVB R2,@XVDP ;put data in
14      DEC R1        ;check for end
15      JEQ EXIT1    ;yes exit
16      DEC R3        ;byte cnt zero ?
17      JLT DATA     ;yes get nxt dat
18      JMP MDATA    ;no put more
19 EXIT1:  RTWP       ;end
20 ;
21 ;      end of file
22 ;

```

Labels From Assembler File "SCNSAV.Z"

XSVDP	05F2	XVDP	F120	SAVE	F200	BYTE1	F214
NDATA	F21E	DIFF	F234	ERROR1	F24C	EXIT	F250
LOAD	F258	DATA	F266	MDATA	F26C	EXIT1	F27A

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